# ISO 21222:2020-01 (E)

## Surface chemical analysis - Scanning probe microscopy - Procedure for the determination of elastic moduli for compliant materials using atomic force microscope and the two-point JKR method

## Contents


Page

**Foreword** ... **iv**

**Introduction** ... **v**

**1 Scope** ... **1**

**2 Normative references** ... **1**

**3 Terms and definitions** ... **1**

**4 Symbols (and abbreviated terms)** ... **4**

**5 Review of contact mechanics** ... **4**
5.1 Introduction ... 4
5.2 Hertzian model ... 5
5.3 Derjaguin-Muller-Toporov (DMT) Model ... 5
5.4 Johnson-Kendall-Roberts (JKR) model ... 6
5.5 JKR–DMT transition ... 6

**6 Procedure of determination of elastic modulus** ... **6**
6.1 Introduction and limitations ... 6
6.2 Measurement of deflection sensitivity and spring constant ... 7
6.3 Measurement of tip radius ... 7
6.4 Measurement of force-distance curve ... 7
6.5 Force-distance curve conversion ... 8
6.6 JKR two-point method ... 9
6.7 Uncertainties ... 9
6.8 Reporting results ... 9

**Annex A** (informative) **Example measurements** ... **11**

**Annex B** (informative) **Result of Inter-laboratory Comparison** ... **15**

**Bibliography** ... **17**